

proportion, however, is undoubtedly raised by loan. At the same time it is pointed out in the report that in two or three localities the entire fund was raised by donations and subscriptions, and in one instance, that of St. Helens, a site and 20,000*l.* was presented by Colonel Gamble, C.B., to the corporation for the establishment of a technical school and free library. Of the large number of technical schools mentioned above, 57 are already at work, 32 new schools having been opened since last year's report. There remain, therefore, 58 schools which, according to the latest information, are still incomplete. Dairy institutes or agricultural schools or colleges have been established by nine English County Councils. In addition to these, the establishment of a central agricultural school is under consideration in Cornwall, and the County Councils of the East, North, and West Ridings of Yorkshire are taking joint action with a view to forming a rural agricultural centre.

SOCIETIES AND ACADEMIES.

LONDON.

Royal Society, November 19, 1896.—“Preliminary Report on the Results obtained with the Prismatic Camera during the Eclipse of 1896.” By J. Norman Lockyer, C.B., F.R.S.

The author first states the circumstances under which Sir George Baden-Powell, K.C.M.G., M.P., with great public spirit, conveyed an eclipse party to Novaya Zemlya in his yacht *Otaria*, to which party was attached Mr. Shackleton, one of the computers employed by the Solar Physics Committee.

The prismatic camera employed, loaned from the Solar Physics Observatory, was carefully adjusted before leaving England, and a programme of exposures was drawn up based upon the experience of 1893. As the station occupied lay at some distance from the central line, this programme was reduced by Mr. Shackleton.

Two of the photographs obtained are reproduced for the information of other workers, as some time must elapse before the discussion of all the results can be completed. This discussion and Mr. Shackleton's report on the local arrangements and details of work, are promised in a subsequent communication.

The lines photographed in the “flash” at the commencement of totality—happily caught by Mr. Shackleton—the wave-lengths of which lines have been measured by Dr. W. J. S. Lockyer, show interesting variations from those photographed by Mr. Fowler in the cusp during the eclipse of 1893.

With the exception of the lines visible in the spectra of hydrogen and helium, and the longest lines of many of the metallic elements, considerable differences of intensity from the lines of Fraunhofer are noticeable.

The coronal rings have been again photographed, and the results of 1893 have been confirmed.

EDINBURGH.

Royal Society, January 4.—Prof. Chrystal in the chair.—Mr. T. S. Muir read the report of the intermediate station on Ben Nevis. He was stationed there from September 1 to September 23, and during that time he took 186 observations, or eight readings per day. Out of twenty-two times that the barometer at the intermediate station (reduced to 32° and sea-level) read higher than that at Fort William, fourteen occurred close together during the first four days of the month, and were followed by a period of fine weather. On the average the intermediate barometer read one-hundredth of an inch lower than the Fort William barometer, and the weather of the month generally was bad. The mean day-difference of temperature between the intermediate, summit, and Fort William stations was as nearly as possible half of that between the summit and the base. But it is probable that during the night the intermediate temperature comes closer to that of the summit, and that the average for the twenty-four hours is closer to that of the summit than Fort William. When the station was enveloped in fog, or between two fog-systems, or close to the fog, the temperature approximated to that of the summit, and when there was no fog visible, or, if it were, at a great height, it approximated to that of the base. Also, when the sky was overcast, or nearly so, the middle temperature was closer to that of the summit; when the sky was clear, to that at Fort William. During the period, the rainfall at the summit was 6½ inches,

at the intermediate station 6 inches, and at Fort William 4½ inches.

—Dr. Munro read a paper on intermediary links between man and the lower animals. He maintained that by the attainment of the erect posture and the consequent conversion of the limbs into hands and feet man became *Homo sapiens*, and inaugurated a new phase of existence, by means of which the manipulative organs became correlated with the progressive development of the brain. In the evolutionary career of man two stages were therefore to be recognised. First, that during which his physical transformation had been effected, so as to adapt him to bipedal locomotion; second, that during which his mental organisation had become a new governing force in the universe. The one, being readily effected according to the laws of morphological adaptation, had a short duration. The other, an extremely slow process, consisted of small increments to his knowledge, acquired by repeated experiences, and reasoning from causes to effects, and from means to ends. The one was merely an adjustment of physical contrivances to physical ends, comparable to that by which the bird, the bat, or the whale had converted its limbs to their special purposes. The other had to be relegated to the mystic laboratory where thought was converted into its material equivalent in the form of increased brain substance. The transition from the semi-erect to the erect posture could not, in point of duration, be at all paralleled with the ages during which this erect being had lived on the globe. It was also probable that this transformation took place in a limited area; so that the chances of finding the intermediary links of this stage were very small. On the other hand, the probability of finding erect beings with skulls in all grades of development, from a slightly changed Simian type up to that of civilised man, was enormously greater. He regarded the erect posture as the most conspicuous line of demarcation between man and the lower animals. From this standpoint, the Java skeleton would come under the category of human; but if this line of distinction was to be dependent in any degree on mental phenomena, Dr. Dubois was perfectly justified in regarding it as a transitional form, because it was a long time after the attainment of the erect posture, before his religious, moral, and intellectual faculties became human characteristics. Dr. Munro believed that many fossil remains of man were intermediary links which marked different stages in the history of mankind, and the further back such investigations carried them, the more Simian-like did the brain-case become. If the geological horizon of the Java man was correctly defined as the borderland between the Pliocene and Quaternary periods, they could form some idea how far back they had to travel to reach the common stock from which men and anthropoid animals had sprung. The lower races of to-day were also survivals of intermediary links which had been thrown into the side eddies of the great stream of evolution.

PARIS.

Academy of Sciences, January 4.—M. A. Cornu in the chair.—Researches on the physiology of muscular action, by MM. A. Chauveau and J. Tissot. When the weight sustained by a muscle and the amount by which it shortens increase together, it is shown experimentally that the respiratory exchanges which represent the energy spent, that is, the oxygen absorbed and the carbon dioxide exhaled, increase as the product of the shortening by the weight.—On a generating and distributing apparatus for acetylene, by M. H. L. Lechappe.—Observations on the new Perrine comet (December 8, 1896) made at the Observatory of Algiers, by MM. Rambaud and F. Sy.—On the consumption of water in locomotives, by M. E. Vicaire. On the basis of some experiments carried out on the Orleans system of railways, a general expression is deduced for the consumption of water on any given section.—Variation of the accidental double refraction of quartz with the direction of the compression, by M. R. Dongier. It is found that the same pressure, applied in two independent directions normal to the ternary axis, affects the wave-surface differently. The experiments will be continued with a view of determining the exact relation between the direction of pressure and the double refraction produced.—The action exercised upon solutions of the haloid salts of the alkalis, by the bases that they contain, by M. A. Ditte. An experimental study of the decrease of solubility of KBr by the addition of a solution of caustic potash, and of NaBr, by caustic soda.—Action of ammonia upon tellurium chloride. Tellurium nitride, by M. René Metzner. At 200°–250° C., TeCl₄ is slowly but completely reduced to metallic tellurium, ammonium chloride and nitrogen being formed. At

0° C. the action is quite different, the compound $\text{TeCl}_4 : 3\text{NH}_3$ being produced. Under certain conditions, somewhat difficult to realise, tellurium nitride, TeN , arises by the spontaneous decomposition of this ammoniacal chloride. The nitride is unstable, detonating violently when struck or heated, but is not attacked by water or by dilute acetic acid.—On the absorption of sulphuretted hydrogen by liquid sulphur, by M. A. H. Pélabon. Liquid sulphur at 440° C. absorbs hydrogen sulphide, which it gives out on solidifying. This can scarcely be a true case of a solution of a gas in a liquid, as it is found that the amount absorbed increases with the temperature, and is only given out on solidifying, no gas being given out by the solution in liquid sulphur even into a vacuum.—On the production of vanilline with the aid of vanilloylcarboxylic acid, by M. Ch. Gassmann.—On the transformation of eugenol into isoeugenol, by M. Ch. Gassmann.—On the principal varieties of wheat consumed in France, by M. Balland. Analyses of wheat from various sources.—Influence of the nervous system on the effects obtained by the injection of serum from vaccinated animals, by MM. Charrin and Nittis. As a general result it was found that lesions of the nervous system, which, as a rule, favour infection, also interfere with the protective power of a serum.—Influence of the different psychic processes upon the blood pressure in man, by MM. A. Binet and N. Vasschide. In all the experiments the blood pressure was increased. This effect was produced by pain, a strong mental effort, conversation, and a fatiguing muscular effort.—The Malpighian tubes of the Orthoptera, by M. L. Bordas.—On the *Spirorbis*; asymmetry of these annelids and in the classification of this and allied species, by MM. Maurice Caullery and Félix Mesnil.—Remarks on the above note, by M. Edmond Perrier.—On the geological history of the Vosges, by M. A. de Lapparent.—On the period of formation of the phosphatic sands at the surface of the brown chalk, by M. Stanislas Meunier. Some remarks on a note by M. de Mercey.

DIARY OF SOCIETIES.

THURSDAY, JANUARY 14.

MATHEMATICAL SOCIETY, at 8.—Supplementary Note on Matrices: J. Brill.—The Partition of a Number into Primes: Prof. Sylvester, F.R.S.—Some Properties of Bessel's Functions: Dr. Hobson, F.R.S.—INSTITUTION OF ELECTRICAL ENGINEERS, at 8.—Inaugural Address of the President, Sir Henry Mance.—SOUTH LONDON ENTOMOLOGICAL AND NATURAL HISTORY SOCIETY.—Some Marine Mimics: E. Step.

FRIDAY, JANUARY 15.

EPIDEMIOLOGICAL SOCIETY, at 8.—Age Incidence in Relation with Cycles of Disease Prevalence: Dr. Hamer.—INSTITUTION OF CIVIL ENGINEERS, at 8.—On "Monier" Girders and Arches: Walter Beer.

SUNDAY, JANUARY 17.

SUNDAY LECTURE SOCIETY, at 4.—The Mountains of Great Britain: Prof. Norman Collie, F.R.S.

MONDAY, JANUARY 18.

SOCIETY OF ARTS, at 8.—Material and Design in Pottery: William Burton.—SOCIETY OF CHEMICAL INDUSTRY, at 8.—The Character of the London Water Supply: W. J. Dibdin.—VICTORIA INSTITUTE, at 4.30.—On the Assouan Embankment: Prof. Hull, F.R.S.

TUESDAY, JANUARY 19.

ROYAL INSTITUTION, at 3.—Animal Electricity: Prof. A. D. Waller, F.R.S.—ROYAL GEOGRAPHICAL SOCIETY, at 4.30.—Sand Dunes: Vaughan Cornish.—ZOOLOGICAL SOCIETY, at 8.30.—Revision of the West Indian Microlepidoptera, with Description of New Species: Lord Walsingham, F.R.S.—On some Points in the Anatomy of the Manatee lately living in the Society's Gardens: F. E. Beddard, F.R.S.—On the Classification of the Primates from the Ophthalmoscopic Appearance of the Fundus oculi: Dr. G. Lindsay Johnson.—ROYAL STATISTICAL SOCIETY, at 5.30.—INSTITUTION OF CIVIL ENGINEERS, at 8.—Paper to be further discussed: Superheated Steam-Engine Trials: Prof. W. Ripper.—Papers to be read, time permitting: The Diversion of the Periyar: Colonel J. Penny-cuik, C.S.I., R.E.—The Periyar Tunnel: M. P. Roscoe Allen.—ROYAL PHOTOGRAPHIC SOCIETY, at 8.—The History of the Half-tone Dot: W. Gamble.—GRESHAM COLLEGE, at 6.—Minute Organisms as Causes of Disease: Dr. Symes Thompson.

WEDNESDAY, JANUARY 20.

SOCIETY OF ARTS, at 8.—The Roller Boat of M. Bazin: Emile Gautier.—GEOLOGICAL SOCIETY, at 8.—On Glacial Phenomena of Palæozoic Age in the Varanger Fjord; The Raised Beaches and Glacial Deposits of the Varanger Fjord: Aubrey Strahan.—ROYAL METEOROLOGICAL SOCIETY, at 7.30.—Report of the Council; Election of Officers and Council.—Address on Shade Temperature: E. Mawley, President.

ROYAL MICROSCOPICAL SOCIETY, at 8.—President's Address.

ENTOMOLOGICAL SOCIETY, at 8.—Annual Meeting.

GRESHAM COLLEGE, at 6.—Bacteria in Air and Water: Dr. Symes Thompson.

THURSDAY, JANUARY 21.

ROYAL SOCIETY, at 4.30.—The following Papers will *probably* be read:—On Cheirostrobos, a New Type of Fossil Cone from the Calcareous Sandstone: Dr. D. H. Scott, F.R.S.—(1) Experiments in Examination of the Peripheral Distribution of the Fibres of the Posterior Roots of some Spinal Nerves, Part II.; (2) Cataleptoid Reflexes in the Monkey; (3) On Reciprocal Innervation of Antagonistic Muscles (third note): Prof. Sherrington, F.R.S.

ROYAL INSTITUTION, at 3.—Some Secrets of Crystals: Prof. H. A. Miers, F.R.S.

LINNEAN SOCIETY, at 8.—On the Origin of the Corpus callosum; a Comparative Study of the Hippocampal Region of the Cerebrum of Marsupialia and certain Cheiroptera: Dr. G. Elliott Smith.—On the Minute Structure of the Nervous System of the Mollusca: Dr. J. Gilchrist.

CHEMICAL SOCIETY, at 8.—Studies of the Properties of Highly Purified Substances. I. The Influence of Moisture on the Production of Ozone from Oxygen and on the Stability of Ozone. II. The Behaviour of Chlorine, Bromine, and Iodine with Mercury. III. The Behaviour of Chlorine under the Influence of the Silent Discharge of Electricity and in Sunlight: W. A. Shenstone.—Action of Diastase on Starch, Part III.: A. R. Ling and J. L. Baker.—The Solution Density and Cupric-reducing Power of Dextrose, Levulose, and Moist Sugar: Horace T. Brown, F.R.S.; Dr. G. Harris Morris; J. H. Millar.—Derivatives of Maclurin, Part II.: A. G. Perkin.

GRESHAM COLLEGE, at 6.—Milk, Meat, and Oysters as Carriers of Disease: Dr. Symes Thompson.

FRIDAY, JANUARY 22.

ROYAL INSTITUTION, at 9.—Properties of Liquid Oxygen: Prof. Dewar, F.R.S.

PHYSICAL SOCIETY, at 5.—An Exhibition of some Simple Apparatus by W. B. Croft.—On the Passage of Electricity through Gases: E. C. Baly.

GRESHAM COLLEGE, at 6.—Diphtheria: Dr. Symes Thompson.

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